

WHAT IS CLAIMED IS:

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1 1. A method for adjusting the resonant frequency of an acoustic resonator
2 comprising the steps of:
3 identifying an electrode-piezoelectric stack having an off-target
4 resonant frequency, said electrode-piezoelectric stack having conductive
5 electrode layers; and
6 oxidizing at least one of said conductive electrode layers of said
7 electrode-piezoelectric stack so as to achieve a target resonant frequency
8 that is dissimilar from said off-target resonant frequency, including intention-
9 ally inducing oxidation by exposing said at least one conductive electrode
10 layer to an oxidizing environment.

[illegible]

1 ① 2. The method of claim 1 wherein said step of oxidizing includes thermally
2 oxidizing said at least one conductive electrode layer of said electrode-
3 piezoelectric stack by exposing said electrode-piezoelectric stack to an
4 oxidation-inducing environment at an elevated temperature.

1 3. The method of claim 2 wherein said step of thermally oxidizing includes
2 exposing a top electrode layer of said conductive electrode layers to said
3 oxidation-inducing environment at said elevated temperature.

1 4. The method of claim 3 wherein said step of thermally oxidizing includes
2 exposing a top surface of said top electrode layer to said oxidation-inducing
3 environment at said elevated temperature, said oxidizing being limited to a top
4 region of said top electrode.

1 5. The method of claim 1 wherein said step of oxidizing includes providing
2 said oxidizing environment as air.

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1 6. The method of claim 1 wherein said step of oxidizing includes forming
2 said oxidizing environment within a rapid thermal annealer (RTA).

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1 9 14. The method of claim 9 wherein said step of intentionally inducing
2 oxidation includes exposing said upper portion of said top electrode within a
3 rapid thermal annealer (RTA).

1 9 15. A film bulk acoustic resonator (FBAR) comprising:
2 a substrate;
3 a bottom electrode above said substrate;
4 a piezoelectric layer above said bottom electrode; and
5 a top electrode having an upper region above said piezoelectric
6 layer, said upper region including metal oxide, at least a portion of said metal
7 oxide being realized by an elevated temperature that is higher than the
8 ambient temperature;
9 wherein said FBAR having said portion of metal oxide has a
10 resonant frequency that is substantially closer to a target resonant frequency
11 than said FBAR without said portion of metal oxide.

1 9 16. The FBAR of claim 15 wherein said top electrode has a thickness that
2 is greater than a comparable electrode without said portion of metal oxide
3 being realized by said elevated temperature that is higher than said ambient
4 temperature.

1 9 17. The FBAR of claim 15 wherein said ambient temperature is room
2 temperature.

1 9 18. The FBAR of claim 15 wherein said top and bottom electrodes and
2 said piezoelectric layer form an element of an FBAR array.

1 9 19. The FBAR of claim 15 wherein said top and bottom electrodes and
2 said piezoelectric layer form an element of a passband filter.

- 1 9 20. The FBAR of claim 19 wherein said resonant frequency is compatible
2 with operation in a code division multiple access (CDMA) personal communi-
3 cation system (PCS).